



Nebraska Public Power District

"Always there when you need us"

NLS2008076
October 3, 2008

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Licensee Event Report No. 2008-001-00
Cooper Nuclear Station, Docket 50-298, DPR-46

Dear Sir or Madam:

The purpose of this correspondence is to forward Licensee Event Report 2008-001-00.

Sincerely,

Demetrius L. Willis
General Manager of Plant Operations

/em

Attachment

cc: Regional Administrator w/attachment
USNRC - Region IV

NPG Distribution w/attachment

Cooper Project Manager w/attachment
USNRC - NRR Project Directorate IV-1

INPO Records Center w/attachment

Senior Resident Inspector w/attachment
USNRC - CNS

SORC Administrator w/attachment

SRAB Administrator w/attachment

CNS Records w/attachment

JE22
NRR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 80 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Cooper Nuclear Station

2. DOCKET NUMBER

05000298

3. PAGE

1 of 4

4. TITLE

Turbine Reheat Stop Valve Failure Results in Manual Scram

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED																																					
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10. POWER LEVEL																																														
069																																														

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

David W. Van Der Kamp, Licensing Manager

TELEPHONE NUMBER (include Area Code)

(402) 825-2904

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
A	SB	ISV	S124	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete EXPECTED SUBMISSION DATE). ☒ NO

15. EXPECTED

SUBMISSION
DATE

MONTH

DAY

YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At 0025 Central Daylight Time (CDT) on August 9, 2008, reactor power was lowered from 85% to 69% to perform main turbine stop valve closure and steam valve functional testing. At 0156 CDT, during the first reheat/stop valve (1A) test, while reheat/stop valve had failed to reopen, a Moisture Separator (MSR) 'C' high level alarm occurred. In accordance with the alarm procedure for MSR high level, the plant was manually scrammed. Control rods fully inserted, and a Primary Containment Isolation System Group 2 isolation occurred. Plant and mitigating system responses were as expected. Risk significance was negligible. The event was caused from a manufacturing defect that caused the reheat/stop valve test solenoid to jam. The root cause was attributed to a practice of performing reheat/stop valve testing at a power level which could result in a MSR high level condition should a reheat/stop valve test solenoid malfunction. Action was taken to prevent recurrence by deleting sections in the functional test procedure for energizing the reheat/stop valve test solenoids.

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17. NARRATIVE (If more space is required, use additional copies of Form 366A)

PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1 at approximately 69% power when the plant was manually scrammed. The station was at this reduced power level to perform main turbine stop valve closure and steam valve functional testing.

BACKGROUND

The power conversion systems at CNS are designed to produce electrical energy through conversion of a portion of thermal energy contained in the saturated steam supplied from the reactor, condense the turbine exhaust steam into water, and return the water to the reactor as heated feedwater. The saturated steam produced by the reactor is passed through the high pressure turbine (EIS:TRB) where the steam is expanded and then exhausted through the moisture separators (EIS:MSR). The moisture separators reduce the moisture content of the steam to close to zero percent. The steam is then passed through the low pressure turbines where the steam is again expanded. From the low pressure turbines, the steam is exhausted into the condenser (EIS:COND) where the steam is condensed and deaerated and then returned to the cycle as condensate.

The main turbine consists of a high pressure section and a low pressure section comprised of two turbines in tandem. Steam from the reactor is admitted to the high pressure turbine section through two main stop valve (EIS: SHV) and governor valve (EIS: SCV) assemblies. After expansion through the high pressure turbine section, steam flows to four moisture separators and returns to the low pressure turbine section by passing through four sets of combined intermediate valves (intercept valves and reheat stop valves combined into one assembly) (EIS:SCV). These intermediate valves are fully open during normal operation and function to limit or isolate steam flow from the moisture separators to the low pressure turbines under certain conditions. This function prevents potential damage to the low pressure turbines.

The turbine utilizes a Digital Electro-Hydraulic (DEH) (EIS:TG) control system consisting of solid state governing devices, governor, startup control devices, emergency devices for turbine and plant protection (overspeed governor, master trip, vacuum trip, motoring protection, thrust bearing wear trip, low bearing oil pressure trip) and special control and test devices. The control system operates the main stop valves, governor valves, bypass valves, reheat stop and intercept valves and other protective devices.

EVENT DESCRIPTION

On August 8, 2008, at 2314 Central Daylight Time (CDT), in preparation for performance of a main turbine stop valve closure and steam valve functional test, power was lowered from 100% to approximately 85%. At 0025 on August 9, 2008, power was further lowered from

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approximately 85% to approximately 69% in accordance with the test procedure. No engineered safety features were inoperable.

On August 9, 2008, at 0156 CDT, a Moisture Separator 'C' high level alarm occurred during the first reheat/stop valve set to be tested, while 1A reheat stop valve indication remained closed. Per the alarm procedure for moisture separator high level, if a reheat/stop valve or intercept valve is closed, procedures require the plant to be manually scrammed.

In accordance with plant procedures, at 0204 CDT, operators manually scrammed the reactor. Control rods fully inserted, and an anticipated Primary Containment Isolation System (PCIS) Group 2 (EISS:JM) signal isolated non-essential systems from Primary Containment. Mitigating equipment responded as expected.

BASIS FOR REPORT

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in actuation of systems listed in paragraph (a)(2)(iv)(B). Specifically, these were (a)(2)(iv)(B)(1) for Reactor Protection System actuation resulting in a reactor scram and (a)(2)(iv)(B)(2) for PCIS Group 2 Isolation. The event was reported as Event Notification number 44402.

SAFETY SIGNIFICANCE

The manual scram initiated in response to high level in a moisture separator due to a reheat/stop valve failure to re-open was not risk significant. The event resulted in a transient with the condenser available and mitigating equipment responded as expected. Therefore, this event resulted in a negligible change in core damage frequency and is already considered in the baseline risk modeled in the CNS Probabilistic Risk Assessment.

This event is not considered a Safety System Functional Failure as defined in Nuclear Energy Institute's NEI 99-02, Revision 4, Regulatory Assessment Performance Indicator Guideline.

CAUSE

The probable mechanistic cause was a defect during the test solenoid valve manufacturing process, such as a machining burr or similar, that caused the test solenoid valve to jam. The root cause was attributed to a practice of performing reheat/stop valve testing at a power level which could result in a MSR high level condition should a reheat/stop valve test solenoid malfunction.

CORRECTIVE ACTIONS

Immediate corrective actions included:

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- Sections in the Main Turbine Stop Valve Closure and Steam Valve Functional Test procedure directing the reheat/stop valve test solenoids to be energized were deleted.
- Testing of the reheat/stop valves was deferred until the next refueling outage.
- A reheat/stop valve solenoid test valve that had been working in good order and removed during RE23 was provided to the valve supplier for examination as a comparison. A second reheat/stop solenoid test valve that had been rejected after post maintenance testing noted "sticking" problems in RE24 (when the reheat/stop test solenoid valves were replaced) was also provided to the valve supplier for examination. Results have not yet been received.

Long term corrective actions being tracked in the CNS corrective action program include:

- Revise the frequency of the Main Turbine Stop Valve Closure and Steam Valve Functional Test procedure such that any sections involving testing of intercept and reheat/stop valves are to be executed when the plant is down-powering for a refueling outage and plant power level is 25% or less.
- Working with the manufacturer, determine if there is an additional step, process, or procedure that can be done to provide assurance that reheat/stop solenoid test valves can be produced and delivered to CNS without manufacturing defect that can cause the test solenoid valve to jam in service.

PREVIOUS EVENTS

LER 2006-001-00 reported a similar event, but that event was attributed to DEH fluid contamination. On February 26, 2006, at 0250 Central Standard Time, Reheat Valve 1B did not re-open after the valve was closed during conduct of a surveillance test on the main turbine reheat/intercept valves. This occurred concurrent with a high level alarm in Moisture Separator 'D'. Per procedure, the plant was manually scrammed. Control rods fully inserted, and a PCIS Group 2 isolation occurred. Reactor power, vessel pressure and level response were as expected. The cause of the event was contamination of the electro-hydraulic fluid in the turbine control system from inadvertent introduction of waste fluid to the control system fluid reservoir on August 14, 2005. Actions were taken to replace the contaminated fluid and cycle all intercept and reheat stop valves via the test solenoids several times to verify flushing of the DEH fluid through the valves. Corrective actions to prevent recurrence included replacing the test solenoid valves for the turbine reheat/intercept and main stop valves and flushing and replacing the electro-hydraulic fluid in the turbine generator control system.

Correspondence Number: **NLS2008076**

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		